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June 14, 2011

VIA HAND DELIVERY

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-A325
Washington, D.C. 20554

FILED/ACCEPTED

JUN 14 2011

Federal Communications Commission
Office of the Secretary

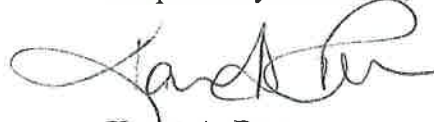
**Re: Response to Letter
KHAI(FM), Wahiawa, Hawaii
Facility ID No. 164206
File No. BPH-20070525AHV**

Dear Ms. Dortch:

Enclosed, as Exhibit A, is the response of Educational Media Foundation, the licensee of KHAI(FM) Wahiawa, Hawaii, to the Commission's letter dated May 11, 2011, requesting that EMF submit an amendment or otherwise resolve the issue concerning the KHAI(FM) proposal and its potential to interfere with the Commission's monitoring station at Waipahu, Hawaii.

Should there be any questions regarding this matter, please contact the undersigned.

Respectfully submitted,



Karen A. Ross

cc: Dale Bickel – FCC
Enclosure

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Protection of FCC Monitoring Station

Background

Educational Media Foundation (EMF) proposes to modify NCE-FM licensed station KHAI from a Class C2 facility operating with 2.2 kW ERP to a class C facility operating with 53 kW ERP (see File Number BPED-20070525AHV). The proposed facility will continue to use the same Shively 6014-14/1-DA antenna that it shares with a number of other broadcasters, meaning that, except for ERP, all parameters of KHAI's present operation are retained.

The FCC operates a protected field office ("monitoring station") at Waipahu, Hawaii, pursuant to 47 C.F.R. §0.121(b). The monitoring station is located at 21° 22' 33.6" North latitude, 157° 59' 44.1" West longitude (NAD83). Per the FCC letter from Dale Bickel regarding CP application BPH-20070525AHV dated May 11, 2011, the signal strength permitted over the monitoring station is limited to 27 mV/m or 88.627 dBu¹.

Discussion

KHAI's center of radiation is 742 meters AMSL, and according to topographic maps and NGDS 30-second data, the elevation at the monitoring station is approximately 3 meters AMSL. KHAI is separated from the monitoring station by approximately 10.8 kilometers². The elevation and distance difference means that the FCC monitoring station can be found at a vertical angle of -4° relative to the KHAI antenna along a bearing of approximately 100.9° true.

The Shively 6014-14/1-DA antenna was specifically designed to protect the FCC monitoring station, and therefore has a deep null at +/- 4°. Per Shively, at KHAI's frequency, the field in the null at +/- 4° from horizontal is 0.015 (see attached).

The power radiated toward the monitoring station from KHAI may be determined by multiplying the proposed KHAI ERP by the square of the field at -4°:

$$53000.0 \text{ watts} \cdot 0.015^2 = 11.925 \text{ watts}^3$$

At 12 watts ERP, the 88.627 dBu contour extends approximately 0.96 kilometer from the KHAI antenna (using FCC F(50,50) contours), or 0.898 kilometer (using the free-space loss formula). Therefore, it falls approximately 9.9 kilometers short of reaching the monitoring station.

¹ This value per calculator at <http://transition.fcc.gov/mb/audio/bickel/findvalues.html> or $\text{dBu} = 20 \log_{10} ((\text{mv/m}) \cdot 1000)$

² 10.787 km using the Great Circle method, 10.763 km using the FCC Flat Earth method

³ Because of the depth of this null, it is unnecessary to further apply the slight reduction in power caused by the directionality of the antenna, which, at 100 degrees true is a relative field of 0.940 (horizontal) or 0.910 (vertical).

The signal strength at the FCC monitoring station can also be calculated by the free-space loss formula

$$e = (7 \cdot \sqrt{p})/d$$

Where:

e = free-space intensity in volts/meter

p = ERP in watts

d = meters

Using the values shown above gives:

$$\begin{aligned} e &= (7 \cdot \sqrt{12})/10800 \\ &= (7 \cdot 3.464102)/10800 \\ &= 24.24871/10800 \\ &= 0.002245 \text{ V/m} \end{aligned}$$

Converting to mV/m gives a predicted free-space field at the monitoring station of 2.245 mV/m, well below the permitted 27mV/m.

Conclusion

Based on the data provided herein, the signal emitted from the proposed KHAI facility toward the FCC monitoring station is calculated to be well within the requirements of protecting the FCC monitoring station from excess energy. The other stations sharing this antenna (e.g., KCCN-FM) use this same -4° null (at slightly varying field values across the band) to protect the FCC's monitoring station, even at higher ERP levels (for example, KCCN operates with 100 kW ERP). Beyond the data, therefore, it can be inferred that KHAI will also properly protect the monitoring station.

Should the FCC request, EMF would be happy to take actual field measurements at the monitoring station in order to ensure compliance while operating at the proposed ERP.

Accordingly, EMF respectfully requests grant of application File Number BPED-20070525AHV so that KHAI can increase its power and improve its service to the public.

Respectfully submitted,



Sam Wallington
Vice President of Engineering
Educational Media Foundation
June 14, 2011

Antenna Mfg.: Shively Labs
Antenna Type: 6014-14/1-DA

Date: 2/6/2007

Station: KHAJ

Beam Tilt 0

Frequency: 103.5

Gain (Max) 37.790

15.774 dB

Channel #: 278

Gain (Horizon) 37.790

15.774 dB

Figure: 3

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.037	0	1.000	46	0.031
-89	0.020	-43	0.059	1	0.903	47	0.057
-88	0.039	-42	0.062	2	0.647	48	0.069
-87	0.058	-41	0.046	3	0.316	49	0.062
-86	0.077	-40	0.014	4	0.015	50	0.039
-85	0.095	-39	0.022	5	0.173	51	0.006
-84	0.114	-38	0.050	6	0.218	52	0.029
-83	0.133	-37	0.061	7	0.145	53	0.058
-82	0.151	-36	0.049	8	0.018	54	0.076
-81	0.168	-35	0.018	9	0.090	55	0.079
-80	0.183	-34	0.020	10	0.133	56	0.066
-79	0.197	-33	0.051	11	0.101	57	0.041
-78	0.208	-32	0.061	12	0.023	58	0.008
-77	0.216	-31	0.046	13	0.056	59	0.029
-76	0.220	-30	0.011	14	0.097	60	0.062
-75	0.218	-29	0.029	15	0.084	61	0.087
-74	0.210	-28	0.059	16	0.030	62	0.102
-73	0.196	-27	0.062	17	0.033	63	0.103
-72	0.176	-26	0.037	18	0.075	64	0.092
-71	0.149	-25	0.007	19	0.075	65	0.070
-70	0.116	-24	0.049	20	0.039	66	0.039
-69	0.078	-23	0.070	21	0.014	67	0.002
-68	0.038	-22	0.056	22	0.056	68	0.038
-67	0.002	-21	0.014	23	0.070	69	0.078
-66	0.039	-20	0.039	24	0.049	70	0.116
-65	0.070	-19	0.075	25	0.007	71	0.149
-64	0.092	-18	0.075	26	0.037	72	0.176
-63	0.103	-17	0.033	27	0.062	73	0.196
-62	0.102	-16	0.030	28	0.059	74	0.210
-61	0.087	-15	0.084	29	0.029	75	0.218
-60	0.062	-14	0.097	30	0.011	76	0.220
-59	0.029	-13	0.056	31	0.046	77	0.216
-58	0.008	-12	0.023	32	0.061	78	0.208
-57	0.041	-11	0.101	33	0.051	79	0.197
-56	0.066	-10	0.133	34	0.020	80	0.183
-55	0.079	-9	0.090	35	0.018	81	0.168
-54	0.076	-8	0.018	36	0.049	82	0.151
-53	0.058	-7	0.145	37	0.061	83	0.133
-52	0.029	-6	0.218	38	0.050	84	0.114
-51	0.006	-5	0.173	39	0.022	85	0.095
-50	0.039	-4	0.015	40	0.014	86	0.077
-49	0.062	-3	0.316	41	0.046	87	0.058
-48	0.069	-2	0.647	42	0.062	88	0.039
-47	0.057	-1	0.903	43	0.059	89	0.020
-46	0.031	0	1.000	44	0.037	90	0.000
-45	0.003			45	0.003		